

### REMARKS

Applicants respectfully requests entry of the amendments and remarks submitted herein. Claim 15 has been amended to recite a "purified or isolated" protein. Support for this amendment can be found in Applicants' specification at page 11, lines 5-27, which provides a definition for "purified" or "isolated" polypeptides. Claims 60-68 have been added. Thus, claims 1, 7, 15, 21, 23-25, and 60-68 are pending. No new matter has been added.

Support for new claims 60-64 can be found in originally-filed claims 15, 21 and 23-25. Claims 65 and 67 depend from claim 1, and claims 66 and 68 depend from claim 7. Support for the term "carrier" is found throughout the specification, for example, at page 50, line 3 and line 20. Support for the term "composition" is found throughout the specification, for example, at page 5, lines 5-10; page 11, lines 5-6; page 44, lines 9-19; and page 46, lines 2-4.

In light of the amendments and the following remarks, reconsideration and allowance of claims 1, 7, 15, 21, 23-25, and 60-68 is respectfully requested.

#### Rejections under 35 U.S.C. § 101

The Examiner rejected claim 15 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicants have amended claim 15 to recite "a purified or isolated protein" as suggested by the examiner. Applicants respectfully request withdrawal of the rejection of claim 15 under 35 U.S.C. § 101.

#### Rejections under 35 U.S.C. § 102(b)

The Examiner maintained the rejection of claims 1, 15, and 21 under 35 U.S.C. § 102(b) as being anticipated by Fraser *et al.* (1999) Accession Number AAY 75751 (WO 99/57280), as set forth in the previous office action. The Examiner stated that WO 99/57280 discloses a novel 508 amino acid *N. gonorrhoeae* polypeptide, SEQ ID NO:2974. The Examiner stated that WO 99/57280 at pages 59-66, 1396 and 1397 discloses an isolated and purified recombinant protein by cloning ORFs into expression vectors. The Examiner further stated that this reference discloses that the polypeptide could be used as a vaccine, an immunogenic composition, or to raise antibodies. Thus, the Examiner concluded that WO 99/57280 anticipates the presently claimed invention.

Applicant respectfully asserts that WO 99/57280 does not disclose all of the features of the present amended claims. WO 99/57280 provides 3,020 nucleic and amino acid sequences corresponding to 999 possible ORFs. This reference also presents computer analyses of these sequences, including the determination of putative amino acid sequences than might be encoded by deduced open reading frames. At pages 1393-1394, WO 99/57280 sets forth a partial DNA sequence identified in *N. gonorrhoeae* (SEQ ID NO:2973). The amino acid sequence that corresponds to this partial DNA sequence is set forth on page 1394 (SEQ ID NO:2974), which is part of what was designated "ORF 987." A partial DNA sequence for *N. meningitidis* is given on page 1394-1395 (SEQ ID NO:2975), and its corresponding amino acid sequence is given on page 1395 (SEQ ID NO:2976). A comparison of the partial putative amino acid sequence from *N. gonorrhoeae* and the partial putative amino acid sequence from *N. meningitidis* is given on pages 1395-1396. Another partial *N. meningitidis* DNA sequence is given on page 1396 (SEQ ID NO:2977) and its corresponding partial amino acid sequence is given on page 1396-1397 (SEQ ID NO:2978). A comparison of this partial putative *N. meningitidis* amino acid sequence to a sequence from *N. gonorrhoeae* is given on pages 1397.

WO 99/57280 provides a description of several generally-known expression systems at pages 59-66. WO 99/57280 teaches the expression of the following ORFs from *N. meningitidis* using known expression systems:

- ORF 919 (Example 2, pages 111-112 and page 1320),
- ORF 279 (Example 3, page 112 and page 635),
- ORF 576 and 576-1 (Example 4, pages 112-113 and page 893),
- ORF 519 and 519-1 (Example 5, page 113 and page 781),
- ORF 121 and 121-1 (Example 6, page 114),
- ORF 128 and 128-1 (Example 7, pages 114-115),
- ORF 206 (Example 8, page 115),
- ORF 287 (Example 9, page 116), and
- ORF 406 (Example 10, pages 116-117).

WO 99/57280 does not teach the expression of ORF 987 from *N. meningitidis*. WO 99/57280 does not disclose the expression of any polypeptide from *N. gonorrhoeae*, let alone the expression and isolation or purification of polypeptides from *N. gonorrhoeae*.

Applicants assert that WO 99/57280 does not teach the claims as presently amended. WO 99/57280 merely sets forth nucleic acid sequences of possible ORFs that might be translated into putative proteins. Moreover, WO 99/57280 does not disclose purification or isolation of any *N. gonorrhoeae* protein, as recited in amended claims 1, 15 and 21. This reference also fails to disclose the molecular weight of the protein as determined by SDS-PAGE under denaturing, non-reducing conditions, as recited in amended claims 1, 15 and 21. As such, WO 99/57280 does not anticipate the present claims.

In light of the above, Applicants respectfully request withdrawal of the rejection of claims 1, 15, and 21 under 35 U.S.C. § 102(b).

#### Rejections under 35 U.S.C. § 112

The Examiner also maintained the rejection of claims 15, 21 and 23-25 under 35 U.S.C. § 112, first paragraph, for lack of enablement.

The Examiner has acknowledged that primary cervical cells are an art-accepted system in which to evaluate the potential immunogenic use of *N. gonorrhoeae* proteins, in view of the fact that there is no valid experimental animal model for the disease, and because experimental gonorrhea cannot ethically be pursued in women. The Examiner has also acknowledged that the experiments previously presented established that p55 can be used to raise antibodies and provide protective immunity by interfering with gonococcal infection.

The Examiner, however, stated that Applicants have not addressed the issue whether the claimed isolated and purified 55kD protein from *N. gonorrhoeae* or isolated and purified polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:4 would effectively prevent, ameliorate, or reduce the incidence of all *N. gonorrhoeae* strains in the established *ex vivo* model system. The Examiner indicated that the previously-submitted Declaration provides supporting evidence for a composition for treating women infected with *N. gonorrhoeae* comprising an immunogenic amount of an anti-phospholipase D (PLD) antibody 1307 that specifically binds to the peptide "RRMHNLSFTADNR" SEQ ID NO:4.

When rejecting a claim under the enablement requirement of section 112, the Examiner bears the "initial burden of setting forth a reasonable explanation as to why [he/she] believes that the scope of protection provided by [the] claim is not adequately enabled by the description of the invention provided in the specification." *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). The Examiner bears the burden of providing evidence or technical reasoning to substantiate her doubts that the specification is not enabling with respect to the scope of a claim sought to be patented. *Ibid.* See also MPEP § 2164.04. Without evidence or technical reasoning to doubt the truth of the statements made in the application, the application must be considered enabling. *Ibid.*

In order for the specification to enable Applicants' vaccine claims, the vaccine need not effectively prevent, ameliorate, or reduce the incidence of all *N. gonorrhoeae* strains. The presence of potentially inoperative embodiments within the scope of a claim does not necessarily render a claim non-enabled. The proper standard is whether a skilled person could determine which embodiments would be operative or inoperative with expenditure of no more effort than is normally required in the art. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984). A considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed." *In re Wands*, 858 F.2d 731, 737, 8 USPQ 2d 1400, 1404 (Fed. Cir. 1988). Time and expense are merely factors in this consideration and are not controlling factors. *United States v. Teletronics, Inc.* 857 F.2d 778, 785 (Fed. Cir. 1988).

When analyzing whether "undue experimentation" is required to practice claimed methods, the key word is "undue" not "experimentation." *In re Angstadt*, 190 U.S.P.Q. 214, 219 (C.C.P.A. 1976). Enablement is not precluded by the necessity for some experimentation, such as performing routine assays. In fact, a considerable amount of experimentation is permissible if the experimentation is merely routine, or if the specification provides a reasonable amount of guidance with respect to the direction in which the experimentation should take. *Ex parte Jackson*, 217 U.S.P.Q. 804, 807 (Bd. App. 1982).

Applicants assert that once they identified, isolated and purified the p55 protein, it would have been within the scope of knowledge of one of skill in the art to raise antibodies against p55

(specification at page 47-48), and to screen different strains of *N. gonorrhoeae* in the art-accepted *ex vivo* model (specification at page 54, line 25 to page 56, line 22). The inventors showed that the p55 protein is involved in the modification of the cell membrane to enhance entry of the gonococcus. Further, they showed that the p55 protein could be used to generate antibodies that interfered with gonococcal invasion. The inventors confirmed that the p55 protein was involved in the modification of the cell membrane to enhance entry of the gonococcus in the previously-submitted Declaration of Dr. Apicella under Rule 1.132. Therefore, undue experimentation would not be necessary in order to determine against which strains of *N. gonorrhoeae* the p55 protein would be effective.

In light of the above, Applicants respectfully request withdrawal of the rejection of claims 15, 21 and 23-25 under 35 U.S.C. § 112, first paragraph.

### CONCLUSION

Applicants submit that claims 1, 7, 15, 21, 23-25, and 60-68 are in condition for allowance, which action is respectfully requested. The Examiner is invited to telephone the undersigned if such would further prosecution.

Applicant believes that no additional claim charges are due. Please apply any charges or credits to deposit account 50-3503.

Respectfully submitted,

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